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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,178	07/25/2003	Brett A. Green	200206559-1	3870

22879 7590 05/17/2007

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
QIN, YIXING	
ART UNIT	**PAPER NUMBER**
2625	

MAIL DATE	DELIVERY MODE
05/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/627,178	GREEN ET AL.	
	Examiner	Art Unit	
	Yixing Qin	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/25/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4-7, 13-16 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 recites that the toner rate can be lowered for one of: a) graphics regions; b) text regions; and c) graphics regions and text regions. However, claims 4 includes the limitation that chooses a) graphics regions, claim 5 chooses b)text regions, and claim 7 chooses a) and c). This is unclear since the rejection can be based upon a), b) or c) of claim 3. Then claims 4-7 would be unclear because they specifically define one of the above (either a) or b) or c)) to be chosen, while that specific one of the above was not limited to in claim 3 (i.e. if text is chosen in claim 3, then claim 4 makes no sense since text, and not graphics was chosen, and vice versa for claim 5. The same line of reasoning goes for claim 7). Claim 6 is rejected because it is dependent upon claim 5. Claims 13-16 are similarly rejected. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

I. Claims 1-20, 24, and 26-29 rejected under 35 U.S.C. 102(b) as being anticipated by Sakuma (U.S. Patent No. 5,663,750).

Regarding claim 1, Sakuma discloses a computer readable medium containing code for controlling operation of a processor associated with a printing device, the code being executable to perform a method comprising:

operating the printing device for printing on a print medium in a primary mode in which the printing device consumes toner at a given rate, from a supply of the toner; (normal mode, column 2, lines 39-59. Would be inherent that the normal mode has an arbitrary given rate since the cited lines disclose a savings mode and another mode that uses less ink than the savings mode, both of which have lower rates than the normal mode.)

operating the printing device in a selected one of a plurality of secondary print modes for printing on a print medium, the secondary print modes consuming the toner at different rates lower than the given rate associated with the primary print mode of the printing device; (savings mode, and a mode that outputs less than a savings mode) and

switching operation of the printing device into a selected one of said plurality of secondary print modes so as to reduce a current rate of consumption of the toner as the supply of the toner is used. (column 2, lines 44-62)

Regarding claim 2, Sakuma discloses the computer readable medium of claim 1, wherein the code further controls

operation of the processor for:

associating ones of said secondary print modes having successively lower rates of consumption with successively lower levels of the supply of the toner; (column 2, lines 44-62)

responding to at least one input that changes as the level of the toner drops below a corresponding one of said successively lower levels; (column 2, lines 39-59 – signals are used to control the rate at which ink drops, so the signals would be the input that changes the rate) and

wherein said switching into said selected one of said secondary print modes is responsive to a change in the input indicating that the level of the toner has dropped below a threshold related to the corresponding one of said successively lower levels. (column 2, line 63-column 3, line 7)

Regarding claims 3, 12, Sakuma discloses wherein the code further controls operation of the processor such that said switching operation selects a secondary print mode configured to consume toner at a rate lower than a rate of the current print mode for at least one of: a) graphics regions; b) text regions; and c) graphics regions and text regions. (column 4, lines 39-44)

Regarding claims 5, 14, Sakuma discloses wherein the secondary print mode selected is configured to consume toner at a rate lower than the current print mode for text regions by character thinning to reduce consumption of toner used to print a same said text region in the selected secondary print mode versus the current print mode. (column 2, lines 3-12)

Regarding claim 15, Sakuma discloses the method of claim 14, wherein character thinning comprises eliminating application of the toner at pixels corresponding to portions of text characters according to a given reduction algorithm. (column 2, lines 10-12)

Regarding claims 8, 17, Sakuma discloses wherein the code controls operation of the processor to alter application of at least one of a particulate powder contrast forming composition and a liquid ink contrast forming composition forming said toner. (column 2, lines 44-62)

Regarding claim 9, Sakuma discloses an encoded medium containing code for controlling operation of a digital processor associated with a printing device, the processor managing application of a toner comprising a contrast forming composition, from a supply of the toner that can be exhausted by continued printing, wherein the processor is constrained by the code to perform the steps of:

varying a rate of toner consumption in the printing device, among a primary print mode in which the toner is consumed at a given rate, and a hierarchy of secondary print modes, each mode consuming a different amount of toner in printing predetermined image data, each said different amount being less than an amount consumed in the primary print mode, said hierarchy of print modes ranging in order from a mode having a greatest rate of toner consumption to a mode having a least rate of toner consumption; (column 2, lines 44-62 – normal mode is the primary mode, then savings mode and the mode using less toner than the savings mode are the secondary modes)

associating predetermined levels of toner with corresponding modes of said hierarchy of secondary print modes; (column 2, line 63-column 3, line 7)

receiving print requests; (column 4, lines 39-44) and

switching from a current print mode to one of said secondary print modes in response to a determination that a current level of toner has dropped below one of said predetermined levels, whereby each successive print mode switched to in said hierarchy in response to said print requests exhibits progressively decreased consumption of toner. (column 2, line 63-column 3, line 7)

Regarding claim 10, Sakuma discloses a method for controlling consumption of toner in a printing device having a supply of the toner, the printing device having a primary print mode at which the toner is consumed at a given rate, the method comprising:

providing a plurality of secondary print modes for printing on a print medium, configured to consume the toner at different rates lower than the given rate associated with the primary print mode of the printing device; (column 2, lines 44-62 – normal mode is the primary mode, then savings mode and the mode using less toner than the savings mode are the secondary modes) and

switching operation of the printing device into a selected one of said plurality of secondary print modes so as to reduce a current rate of consumption of the toner as the supply of the toner is used. (column 2, line 63-column 3, line 7)

Regarding claim 11, Sakuma discloses the method of claim 10, further comprising:

associating ones of said secondary print modes having successively lower rates of consumption with successively lower levels of the supply of the toner; (column 2, lines 44-62)

detecting when the level of the toner has dropped below a corresponding one of said successively lower levels; (column 2, lines 44-62) and

wherein said switching into said selected one of said secondary print modes is done in response to said detecting when the level of the toner has dropped below a threshold related to the corresponding one of said successively lower levels. (column 2, lines 44- column 3, line 7)

Regarding claim 18, Sakuma discloses a printing device having reduced toner consumption modes comprising:

a print processor responsive to an input signal for printing information on a print medium by application of toner from a supply; (column 2, lines 6-15)

memory for storing a hierarchy comprising a primary print mode and a plurality of secondary print modes, each mode in said hierarchy configured to consume progressively less toner to print a given image, whereby each of said modes consumes the toner at a progressively lower rate than the primary print mode of the printing device; (column 2, lines 44 - column 3, line 7)

at least one detector for detecting when a level of toner in the supply drops below a given one of a plurality of threshold values and for generating a control signal in response thereto; (column 2, lines 44 - column 3, line 7)

wherein said processor is responsive to said control signal for switching from a current print mode to a next one of said secondary print modes in said hierarchy based on said detection. (column 2, lines 44 - column 3, line 7)

Regarding claim 19, Sakuma discloses the device of claim 18, wherein the print processor includes a graphics processor responsive to a print request for graphics data for switching dither patterns to print graphics information in a reduced toner consumption mode. (column 8, lines 14-25).

Regarding claim 20, Sakuma discloses the device of claim 18, wherein the print processor includes a text processor responsive to a print request for text data for removing pixel data from characters to print text information in a reduced toner consumption mode. (column 8, lines 14-25).

Regarding claim 24, Sakuma discloses a printer comprising:

means responsive to an input for applying toner from a supply in the printer to a print media so as to form images containing at least one of characters, symbols, lines, graphics and pictures on the print media; (column 4, lines 39-46)

means defining a correspondence between the input and the images, said correspondence affecting a rate at which the toner is applied to form the images during printing; (column 4, lines 39-59)

means for assessing a level of the toner in the supply, and providing a signal representing said level; (column 2, line 48 - column 3, line 7)

means responsive to the signal representing said level, operable to switch from a primary print mode employing one rate at which the toner is applied, to a secondary print mode employing a lower rate at which the toner is applied; (column 2, line 48 - column 3, line 7)

wherein the printer is successively switched in response to the signal representing the level, to successively lower rates of application of the toner, as the supply is exhausted. (column 2, line 48 - column 3, line 7)

Regarding claim 26, Sakuma discloses the printer of claim 24, wherein the means defining the correspondence between the input and the images comprises a processor operable to vary the images produced in response to the input, according to alternative processed versions, each of the versions employing a different level of consumption of the toner and being selected by said means operable to switch from the primary print mode to the secondary print mode. (column 8, lines 14-25)

Regarding claim 27, Sakuma discloses the printer of claim 24, wherein the correspondence between the input and the images is selectively switched to reduce an amount of toner used for a subset of the group consisting of characters, symbols, lines, graphics and pictures, when switching from the primary print mode to the secondary print mode. (column 8, lines 14-25)

Regarding claim 28, Sakuma discloses a method for operating a printing device in a manner that varies a rate of toner consumption in the printing device, said toner comprising a contrast forming composition provided from a supply in the printing device that can be exhausted by continued printing, the printing device having a primary print mode in which the toner is consumed at a given rate, the method comprising:

establishing a hierarchy of secondary print modes, each mode consuming a different amount of toner in printing predetermined image data, each said different amount being less than an amount consumed in the primary print mode, said hierarchy of print modes ranging in order from a mode having a greatest rate of toner

consumption to a mode having a least rate of toner consumption; (column 2, lines 44-column 3, line 7)

associating predetermined levels of toner with corresponding modes of said hierarchy of secondary print modes; (column 2, lines 44-column 3, line 7)

receiving print requests; (column 4, lines 38-45)

and switching from a current print mode to one of said secondary print modes in response to a determination that a current level of toner has dropped below one of said predetermined levels, whereby each successive print mode switched to in said hierarchy in response to said print requests exhibits progressively decreased consumption of toner. (column 2, lines 66-column 3, line 7)

Regarding claim 29, Sakuma discloses a computer readable medium encoded with computer program code such that, when the computer program code is executed by a processor of a computer, the processor performs a method comprising:

providing a plurality of secondary print modes for printing on a print medium, configured to consume toner at different rates, the different rates being lower than a given rate of toner consumption associated with a primary print mode for printing on a print medium; and (column 2, lines 44-column 3, line 7)

activating ones of said plurality of secondary print modes in response to a print request so as to reduce a current rate of consumption of toner as the supply of toner is used. (column 2, lines 44-column 3, line 7)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

II. Claims 21-23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma (U.S. Patent No. 5,663,750).

Regarding claim 21, the Sakuma reference discloses in column 11, lines 15-19 two ways to control the thresholds.

It does not explicitly disclose "wherein said plurality of threshold levels and said hierarchy of secondary modes are configurable by a user "

However, it would be obvious that since one way is automatic, thus other way is manual control of the thresholds.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have allowed user control of the threshold levels.

The motivation would have been to allow greater customization which can better suit the needs of the users.

Therefore, it would have been obvious to improve to obtain the invention as specified.

Regarding claim 22, Sakuma discloses the device of claim 18, wherein said detector comprises a plurality of sensors disposed in said printer for sensing toner level, each sensor associated with a corresponding one of said plurality of threshold levels and operative to generate said control signal when the sensed current toner level crosses said respective threshold level. (column 11, lines 20-22 – it would be obvious to use plural sensors, since there is ability to detect multiple levels from column 2, lines 44- column 3, line 7. Even though Sakuma uses only one remaining ink detection means, it can easily be implemented as plural sensors since the functionality is disclosed.)

Regarding claim 23, Sakuma discloses the device of claim 22, wherein said plurality of level sensors are disposed within a cartridge in said printer and arranged such that, as the level of toner in the cartridge is consumed by ongoing printing, successive ones of the sensors are exposed to air, thereby generating said control signals. (the sensors above would be exposed to air because of the level of the toner drops as toner is used, leaving empty space occupied by air)

Regarding claim 25, Sakuma discloses the printer of claim 24, wherein the means defining the correspondence between the input and the images comprises a digital storage medium for one of storing and loading alternative versions of images corresponding to the input, each of the versions employing a different level of consumption of the toner and being selected by said means operable to switch from the

primary print mode to the secondary print mode. (Sakuma discloses in column 8, lines 14-25 that there are different ways to print. It just does not say that these ways are stored in memory. However, it would have been obvious to one of ordinary skill to store a certain alternate pattern that is to be used to print when the toner is low)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yixing Qin whose telephone number is (571)272-7381. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on (571)272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YQ

TWYLER LAMB
SUPERVISORY PATENT EXAMINER